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NOTICE OF ALLOWANCE AND FEE(S) DUE

21186 7590 12/09/2009

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER

DAY, HERNG DER

ART UNIT

PAPER NUMBER

2128

DATE MAILED: 12/09/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/688,006

10/13/2000

Elizabeth Sisley

1142.001US1

9173

TITLE OF INVENTION: USING CONSTRAIN-BASED HEURISTICS TO SATISFICE STATIC SOFTWARE PARTITIONING AND ALLOCATION OF HETEROGENEOUS DISTRIBUTED SYSTEMS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$755	\$0	\$0	\$755	03/09/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
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or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

21186 7590 12/09/2009

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/688,006 10/13/2000 Elizabeth Sisley 1142.001US1 9173

TITLE OF INVENTION: USING CONSTRAIN-BASED HEURISTICS TO SATISFICE STATIC SOFTWARE PARTITIONING AND ALLOCATION OF HETEROGENEOUS DISTRIBUTED SYSTEMS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional YES \$755 \$0 \$0 \$755 03/09/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
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DAY, HERNG DER 2128 703-013000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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09/688,006	10/13/2000	Elizabeth Sisley	1142.001US1	9173
21186	7590	12/09/2009	EXAMINER	
SCHWEGMAN, LUNDBERG & WOESSNER, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402			DAY, HERNG DER	
			ART UNIT	PAPER NUMBER
			2128	
DATE MAILED: 12/09/2009				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 619 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 619 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	09/688,006	SISLEY, ELIZABETH	
	Examiner	Art Unit	
	HERNG-DER DAY	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendments received 9/8/09 and 10/26/09.
2. ☒ The allowed claim(s) is/are 1, 5-9, and 13-16, now renumbered as 1-10.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
 - (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date ____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other ____. |

DETAILED ACTION

1. This communication is in response to Applicant's Amendment to Office Action dated February 23, 2009, filed September 8, 2009, Applicant's Supplemental Amendment filed October 26, 2009, and telephone interview conducted December 1, 2009.

1-1. Claims 1, 5-7, 9, and 13-16 have been amended. Claims 2, 3, 10, and 11 have been canceled. Claims 1, 5-9, and 13-16 are pending.

1-2. Claims 1, 5-9, and 13-16 have been examined and allowed.

EXAMINER'S AMENDMENT

2. An Examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to Applicants, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

3. Authorization for this Examiner's amendment was given in a telephone interview with Mr. Rodney L. Lacy (Reg. No.: 41,136) on December 1, 2009.

4. FIG. 2 of the replacement drawing sheets received on September 8, 2009, has been amended as follows:

4-1. Block 208 should be read as: "INCLUDE INFO ON HARDWARE SUITE".

4-2. Block 222 should be read as: "COMPONENTS HAVE BEEN BASE ON HARDWARE".

5. The claims have been amended as follows:

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5-1. Replace claim 1 as follows:

1. (Currently Amended) A computerized method for determining an allocation of software and

data components in a distributed system, the method comprising:

modeling the distributed system, the distributed system having a plurality of computing

resources, the computing resources including at least one resource from each of processor

resources, memory resources and communications resources;

determining a set of couplings in the distributed system, said couplings including at least

one coupling from each of control couplings, data couplings and peripheral couplings;

prepartitioning the set of couplings to produce data and control partitions;

preallocating tasks in each coupling in the set of couplings to one of the at least one

processor resource of the plurality of computing resources;

interleaving the data and code partitions;

defining a set of components according to the interleaved data and code partitions, each

of the components having a data and a code segment;

determining a modularity of the set of components;

determining a coupling strength for each coupling in the set of couplings; and

allocating the defined set of components to computer hardware resources having the

computing resources according to the modularity and the coupling strength.

Deleted: having at least one each of processor resources, memory resources and communications resources

Deleted: a target

Deleted: target

Deleted: target

Deleted: processor resources

5-2. Cancel claims 2 and 3.**5-3.** Replace claim 5 as follows:

5. (Currently Amended) The computerized method of claim 1, wherein the set of couplings

comprises a control coupling and the coupling strength of the control coupling is determined

Deleted: coupling

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using a task latency for a task in the control coupling, a timing strength, and a frequency strength.

5-4. Replace claim 6 as follows:

6. (Currently Amended) The computerized method of claim 1, wherein the set of couplings comprises a data coupling and the coupling strength of the data coupling is determined using a latency value, a timing strength, a frequency strength, and a bandwidth strength.

Deleted: coupling

5-5. Replace claim 7 as follows:

7. (Currently Amended) The computerized method of claim 1, wherein the set of couplings comprises a peripheral coupling and the coupling strength of the peripheral coupling is determined using a latency value, a timing strength, and a frequency strength.

Deleted: coupling

5-6. Replace claim 9 as follows:

9. (Currently Amended) A computer-readable storage medium having stored thereon computer executable instructions for performing a method for determining an allocation of software and data components in a distributed system, the method comprising:

modeling the distributed system, the distributed system having a plurality of computing resources, the computing resources including at least one resource from each of processor resources, memory resources and communications resources;

Deleted: having at least one each of processor resources, memory resources and communications resources

Deleted: a target

Deleted: target

determining a set of couplings in the distributed system, said couplings including at least one coupling from each of control couplings, data couplings and peripheral couplings;

Deleted: target

prepartitioning the set of couplings to produce data and code partitions;

preallocating tasks in each coupling in the set of couplings to one of the at least one processor resource of the plurality of computing resources;

Deleted: processor resources

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interleaving the data and code partitions;

defining a set of components according to the interleaved data and code partitions, each of the components having a data and a code segment;

determining a modularity of the set of components;

determining a coupling strength for each coupling in the set of couplings; and

allocating the defined set of components to computer hardware resources having the computing resources according to the modularity and the coupling strength.

5-7. Cancel claims 10 and 11.

5-8. Replace claim 13 as follows:

13. (Currently Amended) The computer-readable storage medium of claim 9, wherein the set of couplings comprises a control coupling and the coupling strength of the control coupling is determined using a task latency for a task in the control coupling, a timing strength, and a frequency strength.

Deleted: coupling

5-9. Replace claim 14 as follows:

14. (Currently Amended) The computer-readable storage medium of claim 9, wherein the set of couplings comprises a data coupling and the coupling strength of the data coupling is determined using a latency value, a timing strength, a frequency strength, and a bandwidth strength.

Deleted: coupling

5-10. Replace claim 15 as follows:

15. (Currently Amended) The computer-readable storage medium of claim 9, wherein the set of couplings comprises a peripheral coupling and the coupling strength of the peripheral coupling is determined using a latency value, a timing strength, and a frequency strength.

Deleted: coupling

5-11. Replace claim 16 as follows:

16. (Currently Amended) The computer-readable storage medium of claim 9, wherein the method further comprises:

- calculating bottleneck ratios; and
- ordering evaluations of couplings based on bottleneck ratios.

Reasons for Allowance

6. The following is an Examiner's statement of reasons for allowance:

6-1. The closest prior art of record discloses:

(1) An approach for designing configurable distributed applications (Gomaa, "Structuring and Configuring Distributed Applications");

(2) A software partitioned multiprocessor system with flexible resource sharing levels (Zalewski et al., U.S. Patent 6,542,926 B2); and

(3) A method for grouping nodes which are coupled in a high coupling strength to each other into a hyper node (Sasagawa et al., U.S. Patent 6,675,155 B2).

6-2. Applicant filed a "DECLARATION UNDER 37 C.F.R. § 1.132" on October 26, 2009, which has been considered and persuasive. The new matter objection and rejection in Office Action dated February 23, 2009, have been withdrawn.

6-3. The prior art does not teach or render obvious the invention as recited in independent claims 1 and 9.

Specifically, independent claims 1 and 9 have identified the distinct combination of features including "determining a set of couplings in the distributed system, said couplings including at least one coupling from each of control couplings, data couplings and peripheral

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couplings”, “defining a set of components according to the interleaved data and code partitions, each of the components having a data and a code segment”, “determining a modularity of the set of components”, “determining a coupling strength for each coupling in the set of couplings”, and “allocating the defined set of components to computer hardware resources having the computing resources according to the modularity and the coupling strength” as shown in FIG. 2, which has not been uncovered in a single teaching, nor would a modification of prior art references be obvious to one of ordinary skill in the art to yield these limitations in the context of the claim.

Moreover, as stated in MPEP § 2131.02, “The identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. In *re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). Therefore, independent claims 1 and 9 and their dependent claims have been allowed over the prior art of record.

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

8. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Herng-der Day whose telephone number is (571) 272-3777. The Examiner can normally be reached on 9:00 - 17:30.

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Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: (571) 272-2100.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kamini S. Shah can be reached on (571) 272-2279. The fax phone numbers for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Kamini S Shah/

Supervisory Patent Examiner, Art Unit 2128

/Herng-der Day/
Examiner, Art Unit 2128

December 1, 2009